

## DEFENSIVENESS AND PSI: PROBLEMS AND PROSPECTS<sup>1</sup>

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### ABSTRACT

The link between defensiveness and psi scoring has long interested parapsychologists. Probably the most systematic research into this relationship has examined individuals' scores on the Defense Mechanism Test (DMT) in relation to their scores on an ESP task. These DMT-ESP studies have found that individuals rated as high defensive on the DMT tend to score below chance on an ESP measure, while those who are low defensive on the DMT tend to have above chance ESP scores. This promising line of research has not been replicated or followed-up by other parapsychologists, perhaps because of practical, methodological and theoretical difficulties associated with the DMT. This paper outlines these difficulties and suggests future lines of research into the relationship between defensiveness and psi scoring.

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from 10 recording channels for the entire experiment.

## 1. INTRODUCTION

Humans seem to vary in how they operate under stress. Some excel in difficult circumstances, yet others perform badly under the same conditions, and stress is one factor which may contribute to human error (Dixon, 1987). Unpleasant or threatening information is one possible source of stress and a wide body of research has focused on how individuals respond to such information; this is generally known as defensiveness research. Some of this research has been conducted in the area of subliminal perception, where individuals are presented, under difficult perceptual circumstances, with emotional and neutral information. "Perceptually defensive" individuals take longer to report awareness of emotional than neutral stimuli, while others who are "perceptually vigilant" report awareness of the emotional stimuli more quickly than for neutral stimuli. Another area of research into defensiveness originates from the Freudian theory of defense mechanisms (the ego's various tactics to combat anxiety provoked by both internal and external events). The Defense Mechanism Test (DMT) is perhaps the most extensively researched instrument which purports to identify the operation of defense mechanisms in both clinical and applied settings (Kline, 1981). It is of interest to parapsychologists because of several studies which have compared individuals' DMT scores with their scores on an ESP task. These studies, to be described in more detail below, have repeatedly found a relationship between defensiveness and psi scoring, whereby low defensive individuals tend to score above chance at an ESP task, and high defensive individuals tend to score below chance at an ESP task. These findings suggest that the DMT, or some other measure of defensiveness, may provide parapsychologists with a valuable tool for examining the interaction between various situational, target-related, cognitive and personality factors, and how this affects the direction and degree of individuals' ESP scoring. Evidently a greater understanding of these factors might allow their manipulation so as to enable parapsychologists to stabilize or improve psi scoring. This paper outlines studies which have indicated a defensiveness-psi relationship, focusing especially on the DMT-ESP studies. It points out the problems associated with the use of the DMT and suggests future lines of research which might overcome these problems and increase our understanding of the defensiveness-psi relationship.

## 2. DEFENSIVENESS AND PSI

Parapsychologists have used a variety of different measures relating defensiveness to ESP scoring, as well as using a variety of definitions of defensiveness. For instance, Braud (1976, 1977), Williams & Duke (1980), and Bellis & Morris (1980) used an "openness questionnaire" which defined non-defensiveness as an ability to deal with unpleasant or threatening material, and a self-disclosing attitude. All of these studies have generally found the same trend towards more psi-hitting from more "open" subjects. A subsequent study using a shorter version of this questionnaire found no significant difference between psi-hitters and psi-missers on questionnaire scores, however the entire sample consisted of low-defensive subjects (Sondow, Braud & Barker, 1982). Reports of bizarre and chaotic dreams, considered to reflect tolerance for "uncensored primary

process material and low defensiveness", were found to correlate significantly with psi success (Sondow, 1987, p.43). Similarly, Roney-Dougal (1982) found that success at both subliminal and extrasensory perception tasks was related to openness to experience of altered states of consciousness. An unusual performance measure of defensiveness was suggested by Stanford & Schroeter (1978): the degree to which subjects chose to recline a chair for a word association ESP task. It was felt that low defensive individuals might choose the fully reclined position, while high defensive individuals might feel more vulnerable, threatened and less able to relax in such a position and should therefore choose a more upright seating posture. This study found that subjects who fully reclined the chair had significantly greater than chance ESP scores, while remaining subjects scored non-significantly below MCE, although the difference between the two groups was not significant.

Despite the variety of methods, measures and definitions of defensiveness seen in the above studies, their results generally agree that less defensive subjects tend to psi-hit and more defensive subjects tend to psi-miss. The reliability of this observation is further strengthened by a group of studies which have relatively systematically examined the defensiveness-psi relationship: the DMT-ESP studies.

## 2.1. The Defense Mechanism Test (DMT)

The DMT was developed in Sweden by Ulf Kragh (1955). Subjects are repeatedly shown a picture meant to provoke defensiveness in a series of gradually lengthening exposures. The picture usually portrays a central "hero" figure (of the same sex as the subject) with an older, ugly "threat" figure emerging from the shadows behind the hero. This picture series is preceded and followed by an exposure of a neutral "distractor" picture (responses to which are not evaluated), and then a second picture is shown in another series of successively lengthening exposures. Using psychoanalytic assumptions, Kragh argued that through projection the subject would identify with the hero figure; then defense mechanisms would be provoked by the apparent threat to the hero from the secondary figure. Initial exposures are very brief and the subject is expected to gain only fragmentary information about the picture content; however for each exposure he or she is required to draw or describe what he or she thought was in the picture, until finally a correct description is given. The various transformations and distortions which occur in the subject's responses can be interpreted by a trained judge as signs of the operation of Freudian defense mechanisms. The technique of presenting the stimulus picture serially and in increasingly lengthy steps is based on the principle known as percept-genetics (Kragh & Smith, 1970; Smith & Westerlundh, 1980). This theory suggests that perception is a constructive or an adaptive process, and that it is possible to examine this process by disrupting or "fractioning" perception through presenting the stimulus very briefly and serially. It is thought that some of the perceptual distortions which occur during the fractioning process may indicate the operation of defense mechanisms. At very brief ("stimulus distal") exposures, the stimulus is highly ambiguous and the subject's perception of it is thought to be dominated by internal, personality factors. At

longer ("stimulus proximal") exposures the stimulus becomes increasingly clear and early perceptions are modified until an accurate description of the stimulus is given. The DMT therefore has three basic theoretical assumptions: that through projection the subject identifies with the hero figure; that the presence of the secondary figure activates Freudian or neo-Freudian defenses; and that by fractioning perception these defenses can be studied and scored.

In applied settings the DMT can reliably predict how people will react in stressful or dangerous situations (for a review of these studies, see Cooper, 1988a). For instance, Kragh (1970) describes two studies which successfully used the DMT to predict which aviation cadets would be unsuccessful in their training, and to predict the training success of Danish attack divers. For the former study, the inter-rater reliabilities (from .59 to .90) were judged to be low to satisfactory compared with ordinary aptitude tests, and as good as or better than those found with other projective tests. The most experienced DMT rater achieved the highest validity. For the latter study, inter-rater reliabilities were higher (from .69 to .92) and again there was a significant correlation between DMT scoring and the criteria set for success or failure in training. The DMT has also been successfully used to predict accident prone parachutists and deep sea divers (Vaernes, 1982; Vaernes & Darragh, 1982). Nowadays, the DMT is used as part of the standard screening procedure for Scandinavian military personnel.

The above research indicates the ability of the DMT to predict susceptibility to stress. It is less clear, however, whether the DMT is actually measuring the operation of Freudian defense mechanisms (Cooper 1982, Cooper & Kline 1986, Kline 1987, Cooper 1988a., 1988b.); I will enlarge on this point in section 2.3. below. For the moment, therefore, one can only say that the DMT appears to be measuring responses to emotional or threatening stimuli, and it has been successfully used in applied settings.

## 2.2. DMT-ESP Studies

Traditionally, there are 13 studies (listed in the Appendix) which have been regarded as the principal DMT-ESP studies. These 13 have systematically compared people's DMT scores with their performance on forced-choice ESP tasks. There are also a number of other studies which have compared scores on the DMT (or approximations to it) with ESP scores. These studies, it appears, have not been included in a recent meta-analysis of DMT-ESP research (Haraldsson, Houtkooper & Hoeltje, 1987) because they are not directly comparable with the principal studies. Some are merely pilot studies; some use free-response rather than forced-choice methodologies; and some use "unofficial" or exploratory versions of the DMT. For the sake of completeness, however, I will briefly outline the findings of these additional studies before moving on to describe the 13 principal DMT-ESP studies.

Johnson & Hartwell (1979) conducted an exploratory study, testing no specific hypotheses, relating defensiveness as measured by the DMT to success at trying to guess

whether an agent was looking at a pleasant picture or a group of unpleasant pictures. Post hoc analyses found that, contrary to expectation, the more defensive subjects were non-significantly more accurate at guessing than the less defensive subjects. With hindsight, however, the authors were critical of their experimental procedure (the environment was noisy and the interactions with subjects were rushed) and in future they would plan to work with extreme DMT scorers. Another pilot study (Johnson & Nordbeck, unpublished) related subjects' DMT scores with their performance at an ESP test of precognition with Zener card symbols as targets. Using an exploratory scoring system for the DMT, it was found that significantly more psi-hitters showed relatively undistorted perceptions of the DMT stimuli than did psi-missers. This study also found another sign, non-significant but in the expected direction, that more defensive subjects tended to psi-miss.

Selecting high and low scorers on their own "unofficial" version of the DMT to participate in a subsequent free-response clairvoyance task incorporating a relaxation tape with an "impression period", Miller & York (1976) found no significant "DMT"-ESP correlation, though results were in the expected direction. A follow-up study by York (1977), presented at the 1976 PA Convention, gave subjects the DMT and subsequently subjects participated in a free-response "ganzfeld" clairvoyance procedure. (It is questionable whether this could be considered a standard ganzfeld, since subjects were not exposed to red light, and did not hear continuous white or pink noise. Instead, they listened to a muscular and mental relaxation tape concluding with five minutes of white noise as an impression period, followed by a reminder to relax, then a second five minute white noise impression period.) This study yielded significant psi scoring overall ( $Z=2.92$ ,  $p<.005$ , two-tailed). Analysis of the DMT scores was done at a later date by Martin Johnson, and are included in an unpublished paper (York & Morris). A comparison of two groups of relatively high and relatively low DMT scorers found no significant difference between the groups' ESP scores ( $t=.82$ , 26df,  $p>.30$ , two-tailed).

Finally, a study with 15 high and 15 low DMT scorers from Icelandic VII (Haraldsson & Gissurarson, 1985), claiming to be the first ever to compare DMT scores with free-response ESP performance, used a ganzfeld procedure with pictorial targets for the ESP task. This study found a small non-significant DMT-ESP correlation opposite to the expected direction.

The results from this diverse group of studies are quite inconclusive. Let us now look in more detail at those studies which have more systematically examined the relationship between DMT scores and scores on forced-choice ESP tasks. The first study arose from an idea of Martin Johnson (who had studied with Kragh and was very familiar with the DMT) that people who tend to be defensive in normal perception might respond similarly towards extrasensory perceptions (Carpenter 1965). These studies all have broadly similar characteristics. Subjects are volunteer undergraduate students (the Icelandic series used male subjects only and tried to avoid using psychology students). There are two testing sessions. In one, subjects are administered the DMT in groups (from 2 to 6

individuals), and in the other they take one or two psi tests which tend to be of restricted-choice clairvoyance or precognitive design. For instance, the clairvoyance test may consist of a computer game where the subject has to guess which of four windows on a computer screen has been randomly selected by the computer as the target. Subjects may work in pairs and a sense of light-hearted competition may be encouraged. For the precognition test subjects may be asked to guess which of four letters will later be selected by a computer as target. In most of the studies the DMT results were scored independently and only after all the ESP results had been collected were the ESP scores correlated with the DMT scores. The results are summarised in Table 1.

Table 1: A summary of the main characteristics of the principal DMT-ESP studies - correlations between DMT and ESP scores (adapted from Haraldsson et al. 1987).

Study	N	Spearman's rho	p*	footnotes
US I	10	.79	.01	1
US II	16	.67	.005	1
US III	11	.59	.05	
DUTCH I	18	.42	.05	2
DUTCH II	49	.26	.05	
DUTCH III	16	-.19	NS	
ICELANDIC I	37	.47	.002	3
ICELANDIC II	37	.17	NS	
ICELANDIC III	41	.02	NS	
ICELANDIC IV	54	.26	.03	4
ICELANDIC V	46	.11	NS	
ICELANDIC VI	44	.06	NS	
ICELANDIC VII	48	.11	NS	

\* One-tailed

1. Pilot study, not double-blind.

2. Pilot study, individual DMT testing.

3. Icelandic Studies I to VI gave subjects one clairvoyance and one precognition test; Icelandic VII gave two clairvoyance tests. The correlations shown are between DMT scores and total ESP scores.

4. Only partially double-blind, but this was shown not to have influenced ratings. Prior selection of subjects based on extreme dream recall questionnaire scores or extreme scores on precognition test.

It seems that Johnson's intuition was correct: in all but one of the 13 studies, the DMT-ESP correlation has been in a positive direction, and in seven of these studies the correlation is independently significant. High defensive subjects tend to score below chance at forced choice psi tests, and low defensive subjects tend to score above chance. A meta-analysis of these studies (conducted by Haraldsson, Houtkooper & Hoeltje, 1987) found this correlation to be highly significant ( $p=0.0000019$ , one-tailed). When the three studies which did not have a double-blind design were excluded from the analysis, there remained a significant correlation ( $p=0.00028$ , one-tailed) (Haraldsson, Houtkooper & Hoeltje, 1987).

Table 1 illustrates, however, that the strength of the DMT-ESP correlation has gradually weakened. One possible explanation for this decline may be that US I and US II were not double-blind, perhaps leading to an artefactual inflation of the correlation for these studies. However, even excluding the studies which were not double-blind, there remains a pattern of positive but declining DMT-ESP correlations. It has been suggested that the pattern of correlation represents some kind of initial effect or experimenter effect, as each of the experimental series was begun with fresh energy and enthusiasm by either Martin Johnson or Erlendur Haraldsson (Haraldsson & Johnson, 1979). On the other hand, it is possible that the declining correlations in each of these series reflect unreported changes in attitude, methodology, or analysis of results. Indeed, the authors themselves stress the need for independent replication of the DMT-ESP studies (Johnson & Haraldsson, 1984; Haraldsson, Houtkooper & Hoeltje, 1987), as most of these studies have been conducted at least in part by only two researchers: Johnson and Haraldsson. Given that replicable patterns can be hard to come by in parapsychology, why is it that other parapsychologists have been slow to follow-up on these promising indications of a fairly consistent relationship between defensiveness and ESP scoring? The answer may lie with some difficulties associated with the DMT.

### 2.3. Drawbacks of the DMT

One obvious problem affecting all of parapsychology is the lack of manpower and funding to follow up interesting lines of research. However, there are some practical, methodological and theoretical drawbacks specifically associated with the DMT which may have discouraged other researchers from working with it.

1. To properly administer and score the DMT requires 3 months intensive training (Johnson & Haraldsson, 1984); this is expensive both in terms of time and money. The interpretation of DMT protocols is a particularly skilled task; it may take more than three months of experience before inter- and intra-rater reliability is satisfactory (Haraldsson & Johnson, 1979). Martin Johnson and Ulf Kragh have done most of the scoring in the 13 DMT-ESP studies, and have shown a very respectable inter-rater reliability (e.g. .93 and .90 for two samples of 12 subjects each; Johnson & Haraldsson, 1984). However, as Kragh developed the DMT and Johnson studied with Kragh there could hardly be two

people better qualified to evaluate DMT protocols; this task may be somewhat more daunting to less experienced researchers.

2. The DMT was developed in Scandinavia and is unfamiliar to psychologists in Western Europe and the USA; speaking from my own experience as a member of the Psychology Department at Edinburgh University, I have yet to discover a non-parapsychologist colleague here who is familiar with the DMT. This situation may not be helped by the fact that, so far as I know, there is only one published translation of the complex scoring scheme into English (Westerlundh, 1976; there is also an English translation in an unpublished PhD thesis by Cooper, 1982). Therefore, until knowledge of the DMT spreads outside of Scandinavia, few will use it, and so few will be able to score it reliably.

3. Another drawback with the DMT is that it is time consuming to administer and score. Group administration of the DMT, quicker than individual testing, is the norm for the DMT-ESP studies. However, this is less desirable than individual testing, as the former makes it difficult to ensure that each subject experiences identical levels of stimulus and background illumination, identical angles and distances from the screen, and so on. Regardless of whether subjects are tested individually or in groups, each subject's series of responses must be scored individually - a lengthy process. When resources of time and money are scarce, parapsychologists might be more inclined to use a more convenient measure of defensiveness.

4. Finally, the DMT is based on individuals' responses to a series of exposures to only two pictures which are intended to be threatening. This raises the question of whether we can know what the DMT is actually measuring. Detailed studies of the DMT, manipulating the content of the stimulus pictures, have shown that the presence of the threatening secondary figure is necessary for producing the distorted responses which are thought to correspond to defense mechanisms (e.g. Cooper & Kline, 1986). However, it has yet to be demonstrated that Freudian mechanisms are indeed involved. Kline (1987) argues that, although the various signs of defensiveness were derived from psychoanalytic studies of individuals in a clinical setting, these have face validity only. For example, the defense mechanism of Isolation is coded when "the hero and secondary figure are separated or isolated; one may not be seen"; for Denial, "the threat is emphatically denied" (Kline, 1987, p.55). Just because a part of a DMT protocol resembles a defense mechanism, does not confirm that the individual's responses actually reflect the operation of Freudian processes. While Cooper & Kline (1986) found some indications that responses to the DMT were as hypothesized from Freudian theory, they also found little correspondence between the repression scale of the DMT and a measure of perceptual defense, thus casting doubt on this aspect of the DMT. Elsewhere, Cooper has suggested that even more pronounced distortions might be elicited by abandoning the "hero/secondary" notion in favour of a purely aversive stimulus. Anecdotally, he noticed that "more dramatic distortions were observed to picture 8BM of the TAT, which depicts



a rather primitive surgical operation, than to the more traditional "ugly face" threat" (Cooper, 1982, p.286).

### 3. FUTURE DIRECTIONS FOR DEFENSIVENESS-PSI RESEARCH

The above-mentioned problems should not overshadow the fact that the DMT can successfully predict responses to environmental stress in a practical setting. Further, it already has an honourable place in parapsychological research. This position will be strengthened by those future studies which are planning to use the DMT. Icelandic study X will soon be conducted, hopefully to be followed by the publication of the results of Icelandic studies VIII, IX, and X (Haraldsson, personal communication). Adrian Parker is studying the relationship between absorption, and defensiveness as measured by the DMT, and reported anomalous experiences, from clinical, cognitive and parapsychological perspectives (Parker, 1989). Another question worth following up is whether the DMT-ESP correlation is specific to restricted-choice ESP tasks. The studies described in section 2.2, which have used the DMT (or approximations to it) and free-response ESP tasks (Miller & York, 1976; York, 1977, results in York & Morris, unpublished; haraldsson & Gissurarson, 1985) have quite inconclusive results. These authors have speculated that the ganzfeld procedure may be insufficiently stressful for the subject to activate defense mechanisms; in fact Haraldsson & Gissurarson point out that in psychoanalytic theory, free association (similar in some respects to the ganzfeld situation) has been considered to mitigate against the operation of defense mechanisms. Recall that many of the DMT-ESP studies attempted to create a competitive situation for the ESP tests which may raise subjects' stress levels. York & Morris (unpublished) suggest that future studies might look at the DMT-ESP correlation in different psi-testing modes, for example competition versus no competition, and use of psi-conductive procedures versus not. Research along these lines may give further insight into the relationship between defensiveness and psi scoring.

Any DMT research which builds upon what has gone before in this field can only be welcomed. However, the promising DMT-ESP findings can also be followed up by research which is conceptually similar, though not using the DMT itself. For instance, future research might consider alternative measures of defensiveness which could go some way to overcoming some of the problems particularly associated with the DMT. One strategy might be to use a subliminal perception task aimed at identifying perceptually defensive or vigilant individuals. Such a task could be administered quickly and automatically, requiring no training, and it could be objectively scored. This might encourage attempts to replicate any interesting findings. It might use a variety of stimuli, neutral, emotional and control (i.e. transmitting the same amount of light as the experimental stimuli, but conveying no meaning to the subject), thus permitting a greater understanding of what kinds of stimuli elicit which reactions. Given the already established links between defensiveness and psi scoring, the use of a wider range of stimuli would therefore enable more detailed study of the factors which appear to influence direction of psi scoring (for example, clear identification of defensive or

vigilant individuals might suggest what kinds of ESP target material would be most suitable for them).

I am currently conducting some preliminary research along these lines, exploring whether it is possible to identify perceptually defensive or vigilant individuals by presenting them with weakly illuminated stimulus slides and asking them to indicate when they first become aware of the presence of the slides. At this "subjective awareness threshold", the experimental participant reports no awareness of the presence of any other information apart from the overall rectangular shape of the slide. In fact, however, each slide portrays one of four different categories of information: either simple black and white line drawings which have previously been judged to be emotionally negative or neutral; or matched control slides, which are designed to have the same light transmitting properties as the pictorial slides, but which do not portray any meaningful information. Fluctuations in the illumination level at which the experimental participants report awareness of the slide may represent an index of their reactions to the subliminally-presented emotional, neutral and control information, thus enabling them to be identified as perceptually defensive or vigilant.

Some indication that this may be a promising general technique to explore perceptual defense and vigilance was found in an undergraduate thesis by Peter Gregor, conducted at the Psychology Department in Edinburgh University in 1972, and supervised by John Beloff (Gregor, 1972). Gregor presented subjects with gradually brightening emotional (e.g. cancer), neutral (e.g. circus) and control words (reversed and inverted emotional or neutral words) on slides, and used subjects' reported awareness of the presence of a slide as an indicator of their perceptual defensiveness or vigilance (Gregor reports that his experimental participants were never aware that the slides contained any information). The results of this study indicated generally higher thresholds for slides containing emotional words compared to their neutral counterparts; however, the highest threshold overall was found for a slide which portrayed a nonsense word. Thus, the results suggest that individuals may respond to the meaning of a subliminally-presented stimulus, but it is not clear whether this response is due to defensive processes.

The studies currently being conducted seek to preserve the strengths of Gregor's method (simplicity; and the use of a neutral indicator of subjective awareness threshold which avoids criticisms of response bias) while resolving its weaknesses (manual slide insertion and illumination means the experimenter may not be blind as to the slide contents, and may not present each slide in an identical manner; manual recording of results may also allow bias and error to affect results). The apparatus used by Gregor (known as "Pandora's Box") has been cannibalized and modernized so that slide presentation, illumination, and recording of results are all now under computer control. Pandora's Box is a tachistoscope which has one field constantly illuminated by an electroluminescent panel (thus removing the need for total dark adaptation in subjects). The second field has been replaced by a slide projector placed so that, when a slide drops into the projector, at full illumination the subject sees the slide contents in the centre of the constantly

illuminated background field. The projector bulb has been replaced by a small electroluminescent panel which may be varied in intensity through a computer program. For the main pilot study just completed, 21 subjects each did two sessions on Pandora's Box. In each session, subjects did 5 practice trials (a trial is where one slide is gradually illuminated until the subject indicates that he or she has become aware of its presence), and then 2 runs of 16 trials, separated by a short break half-way through. For stimuli there were 8 slides portraying pictures which had previously been judged (by 20 individuals, 9 of whom took part in the present study) to be emotionally negative, 8 slides portraying emotionally neutral pictures, and 16 control slides, matched to each of the emotional or neutral slides. Half of the slides were shown at the first session, half at the second session, counterbalanced across subjects. Each subject saw the slides in a different random order.

The slide illumination level at which each subject reported awareness of each slide was calculated. The preliminary results from this pilot study suggest that some individuals do indeed respond either defensively or vigilantly to negative emotional slides, compared to the other slide categories, while other individuals showed no consistent effects whatsoever. Further, it was found that of those individuals who had previously rated the pictures for emotionality, those who appeared to be defensive or vigilant on Pandora's Box had rated the "emotional" slides more negatively emotional than those who showed no consistent scoring on Pandora's Box. This post hoc finding therefore provides additional support for the hypothesis that changes in subjective awareness threshold for emotional as compared to other slides were due to the emotional nature of these slides for the individual participants rather than to some as yet undiscovered artefact.

These effects were not strong, however, and future studies will attempt to strengthen the effects by cutting out some sources of noise in the data. Should these attempts be successful, it will then be possible to conduct a conceptual replication of the DMT-ESP studies, by comparing individuals' defensiveness or vigilance scores with their scores on a psi task. Whereas the DMT-ESP studies have tested individuals in quite different situations, using threatening pictures for the DMT yet emotionally neutral targets such as letters or boxes for the ESP tests, future studies should increase the similarities between the conditions for testing for perceptual defensiveness or vigilance, and the conditions for testing ESP performance. Possibly, the correlation which has already been observed between defensiveness and psi may be enhanced by making the two situations more comparable. Therefore I would aim to use for the ESP task target material similar if not identical to that used for the subliminal perception task. This is not a new idea; in fact it was suggested in the first ever DMT-ESP report: "If the ESP targets were constructed out of threatening figures rather than geometric designs, would the effect be stronger?" (Carpenter, 1965, p.73).

#### 4. SUMMARY AND CONCLUSIONS

The link between defensiveness and psi scoring has interested parapsychologists for many years. The most consistent research into this relationship has been the DMT-ESP studies; these have found that individuals rated as high defensive on the DMT tend to score below chance on a psi measure, while those who are low defensive on the DMT tend to score above chance on a psi measure. This research has lots of exciting implications but it has not been replicated or followed up by other parapsychologists, I believe, because of practical, methodological and theoretical difficulties associated with the DMT. While one should applaud studies incorporating the DMT itself, future research might be able to overcome these difficulties by exploring alternative methods for identifying individuals as perceptually defensive or vigilant. If successful, this may encourage parapsychologists to conceptually replicate and extend the DMT-ESP studies. Further insights into the defensiveness-psi relationship may also be gained by exploring different psi-testing situations in relation to DMT scores.

There are several reasons why research to follow up on the DMT-ESP studies would be of interest to parapsychologists. First of all, there is the question of psi-missing and psi-hitting. If we can find a convenient test which predicts reliably whether or not a person is likely to score above or below chance at a psi task, then we may begin to explore reasons why people psi-miss. I should stress at this point that while people are usually either perceptually defensive or vigilant, this may not imply that they are therefore bound to either psi-miss or psi-hit whenever they take part in an ESP test. More research is needed on this question, but it is quite likely that methodological, procedural and personality factors may interact to produce psi scoring in a particular direction. This suggestion is supported by research by Stanford and colleagues into the interaction between noise level in the ganzfeld, extraversion-introversion, and the enjoyment level of the subject in a ganzfeld experiment. Working on the hypothesis that noise provides stimulation which heightens arousal and thereby influences performance to approach or exceed optimal arousal levels, it was found that extraverts (who are thought to be typically less aroused than introverts in a given situation) enjoyed the ganzfeld situation under noise more than introverts did (Stanford, Frank, Kass & Skoll, 1989). Whether ganzfeld enjoyment was related to ESP scoring is to be reported in a subsequent paper, but the present study indicates how one procedural factor, noise in the ganzfeld, may interact with a personality variable. Another aspect of ESP experiments which may be altered to suit subject types or preferences is the target. As myself and Deborah Delanoy pointed out recently (Delanoy, 1989; Watt, 1989), there has been little systematic research to identify the characteristics of good ESP targets. I will be looking at individuals' responses to emotional and neutral targets in both subliminal and extrasensory conditions. This may give some valuable clues as to which combination of target and subject characteristics seems to encourage positive psi-scoring.

In sum, further research into factors influencing the defensiveness-psi relationship may enable parapsychologists to improve psi scoring by helping them to select experimental

methodologies most suited to each individual participant, and by enabling the training of participants to capitalize on the factors which seem to encourage psi-hitting and to reduce the influence of factors apparently linked to psi-missing.

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APPENDIX - Identification of the principal DMT-ESP studies.

Label	Authors
US I	Carpenter (1965)
US II	Johnson & Kanthamani (1967)
US III	Johnson & Kanthamani (1967)
DUTCH I	Johnson (1975)
DUTCH II	Johnson & Lubke (1977)
DUTCH III	Houtkooper, unpublished, results reported in Haraldsson Houtkooper & Hoeltje (1987)
ICELANDIC I	Haraldsson (1978)
ICELANDIC II	Johnson & Haraldsson (1979)
ICELANDIC III	Haraldsson & Johnson (1979)
ICELANDIC IV	Johnson & Haraldsson (1984)
ICELANDIC V	Johnson & Haraldsson (1984)
ICELANDIC VI	Haraldsson & Johnson (1986)
ICELANDIC VII	Haraldsson, Houtkooper & Hoeltje (1987)